







17. (Cancelled)

18. (Original) The apparatus of claim 14, further comprising memory coupled to the control circuitry, wherein the control circuitry is configured to store data corresponding to the plurality of sensor elements in the memory.

19. (Original) The apparatus of claim 1, further comprising a microfluidic channel coupled to at least one of the addressable cells.

20. (Original) The apparatus of claim 1, further comprising a selective membrane coupled to at least one of the addressable cells.

21. (Original) The apparatus of claim 20, wherein the selective membrane includes at least one member selected from the group consisting of chemically selective membranes and biologically selective membranes.

22-40. (Cancelled)

41. (New) The apparatus of claim 1, wherein the spectroscopy is an impedance spectroscopy.

42. (New) An apparatus, comprising: an array addressed device including a plurality of addressable cells, each of the plurality of addressable cells including at least two electrodes; and a

spectroscope optically coupled to the condensed array addressed device, wherein the array addressed device comprises integrating impedance measurement circuitry into the array addressed device and memory array to perform an electrical readout.

43. (New) The apparatus of claim 42, wherein the spectroscope includes an infrared spectroscope.

44. (New) The apparatus of claim 43, wherein the infrared spectroscope includes a Fourier transform infrared spectroscope.

45. (New) The apparatus of claim 43, wherein an infrared spectroscope signal from the infrared spectroscope is electromodulated by applying potential between the at least two electrodes in at least one of the plurality of cells.

46. (New) The apparatus of claim 43, wherein an infrared spectroscope signal from the infrared spectroscope is photo-modulated by applying a modulated UV-VIS signal to a surface of at least one of the at least two electrodes.

47. (New) The apparatus of claim 42, wherein the waveguide includes a total internal reflection prism and the spectroscope is optically coupled to the total internal reflection prism.

48. (New) The apparatus of claim 42, wherein each of the plurality of addressable cells includes

